

## REMARKS

Claims 1-29 were rejected prior to the Office Action. In the Office Action claims 1-29 were rejected. In this response, claim 1 is amended. Claims 1-29 are pending.

### **Specification Objections**

Applicatns have amended the specification in accordance with the Office Action's suggestion. Applicants thank the Examiner for his attention to this detail.

### **Claim Rejections under 35 U.S.C. § 101**

The Office action rejected claims claims 1-29 under § 101 stating that “the claims as a whole do not provide a physical transformation or a useful, tangible, and concrete result.” (Office action, 5). Applicants respectfully disagree.

Independent claim 1 has been amended to make clear that the method is performed by a specific aparatus: a computer system. The Federal Circuit noted that “[a] claimed process involving a fundamental principle that uses a particular machine or apparatus would not pre-empt uses of the principle that do not also use the specified machine or apparatus in the manner claimed.” *In re Bilski*, \_\_\_\_ F.3d. \_\_\_\_ (Fed. Cir. 2008) (Slip Op at \*11). Dependent claims 2-17 are similarly directed to patentable subject matter.

Independent claim 18 is directed to a computer program stored in a tangible medium, which is an article of manufacture and therefore patentable subject matter under 35 U.S.C. § 101. M.P.E.P. § 2501.01, I (“When a computer program is recited in conjunction with a physical structure, such as a computer memory, USPTO personnel should treat the claim as a product claim.”) Claim 18 makes clear that the executable instructions are stored on a tangible medium and is therefore a statutory product. The Board of Patent Appeals and Interferences has confirmed the patentability of claim of the type of claim 18 after the CAFC’s recent *Nuitjen* and *Bilski* decisions. *Ex Parte Bo Li*, Appeal 2008-1213, 9 (BPAI Nov. 6, 2008) (“It has been the practice for a number of year that a ‘Beauregard Claim’ of this nature be considered statutory at the USPTO as a product claim.”) Dependent claims 19-23 are sililarly directed to patentable subject matter.

Claim 24 requires, in part, “inducting at least one fracture in the subterrenan formation.” Creating a fracture in Earth is a clear example of a physical transformation. In *Bilski*, the

Federal circuit states that “[a] claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.” *In re Bilski*, \_\_\_ F.3d. \_\_\_ (Fed. Cir. 2008) (Slip Op. at \*10) (*citing Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)). Claims 24 is therefore directed to patentable subject matter because it requires “the transformation of a particular article into a different state or thing.” Dependent claims 25-29 are similarly directed to patentable subject matter.

### **Claim Rejections under 35 U.S.C. § 112**

The Office action states:

12. Claims 2, 19, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 2, 19, and 25 recite “... steps (a), (b), and (c) are performed prior to creating any of the fractures....”. According to the claim invention, there is a creation of fracture before the steps are performed. However, there is no any steps how and when the fractures are created. Therefore, it is proper to reject the claims under 112 for being vague and indefinite and further for missing steps of “creating a fracture” before the steps are performed.

13. Claims 2, 19, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are:

d. As per claim 2, 19, and 25, claims recite “prior to creating”. According to the claim limitation, there is a creation of fractures. However, no limitation in the claims that shows how the fractures are created. Therefore, it is proper to reject the claims for being omitting an essential step of “creating a fracture”.

(Office action, 5-6)

Applicants disagree.

Claims 2, 19, and 29 do not suffer from indefiniteness. The claims include requirements that certain steps take place “prior to creating fractures in a subterranean formation.” This limitation is an additional limitation on claim 1, 18, and 28. To require that the claim actually include a limitation of creating fractures would defeat the purpose of the limitation imposed by

claims 2, 19, and 29. The limitations of claims 2, 19, and 29 introduces no ambiguity to whether the claim is infringed or not: when steps (a), (b), and (c) of claims 1, 19, or 29 are carried out before creating any of the fractures in the subterranean formation, then claims 2, 19, and 29 are infringed. Nor does the failure to include creating a fracture amount to a missing step. The method and software of claims 2, 19, and 29 are fully operative and functional without the purported missing step of “creating a fracture in the subterranean formation.”

The Office action’s assertion that “according to the claim invention, there is a creation of fracture before the steps are performed” is simply incorrect. The methods and software of claims 2, 19, and 29 are carried out before the creation of a fracture in the subterranean formation by its limitation.

The Office action’s assertion that “no limitation in the claims that shows how the fractures created” is irrelevant to the question of whether the claim is definite. Applicants have no duty to specify how (or when) the fractures are created. Instead, Applicants have included limitations for when the steps of the claimed method are carried out.

### **Claim Rejections under 35 U.S.C. § 102**

The Office action states:

16. As per Claim 1, Soliman discloses a method of optimizing a number, placement and size of fractures in a subterranean formation (See: “Summary” in page 966) comprising the steps of:

(a) determining one or more geomechanical stresses induced by each fracture based on the dimensions and location of each fracture (See: page 967, “Determining Magnitude and Orientation of Least Principal Stress” and also Figs. 1 and 2);

(b) determining a geomechanical maximum number of fractures based on the geomechanical stresses induced by each of the fractures (such as . . . *reaching five fractures after a month(i.e. five fractures are maximum number of fractures) but declined to only two fractures after 24 month . . .*; See: page 969, middle column, lines 9-13);

(c) determining a predicted stress field based on the geomechanical stresses induced by each fracture (See: page 967, “Determining Magnitude and Orientation of Least Principal Stress”); and

(d) generating an optimized number, placement and size of one or more fractures in subterranean formation (See: Figs. 15, 16, 17, table 2 and corresponding texts), where generating the optimized number, placement and size for one or more fractures in a subterranean formation is based, at least in part, one or more of:

the geomechanical maximum number of fractures (such as . . . *reaching five fractures after a month (i.e. five fractures are maximum number of fractures) but declined to only two fractures after 24 month . . .*; See: page 969, middle column, lines 9-13); and the predicted stress field based on the geomechanical stresses induced by each fracture (See: page 967, “Determining Magnitude and Orientation of Least Principal Stress”).

(Office action, 7-8)

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Claim 1 requires, in part, “generating an optimized number, placement and size for one or more fractures in a subterranean formation, where generating the optimized number, placement and size for one or more fractures in a subterranean formation is based, at least in part, on one or more of: the geomechanical maximum number of fractures; and the predicted stress field based on the geomechanical stresses induced by each fracture.” Even assuming for the sake of argument that Soliman at 969 discloses determining a optimized number of fractures, which Applicants do no concede, there is no disclosure of further determining the placement and size of each of these fractures. Soliman simply does not disclose this limitation. Nor is this limitation inherent in the disclosure of Soliman.

Furthermore, Applicants simply disagree that Soliman discloses a determination of the optimized number, based, at least in part, on one or more of: the geomechanical maximum number of fractures; and the predicted stress field based on the geomechanical stresses induced by each fracture. Soliman’s discussion of “optimum number of fractures” is based on declining flow rates over time. Soliman states that “the optimum number of fractures depends on formation and fluid properties.” “Formation and fluid properties” are not a disclosure of either (1) the geomechanical maximum number of fractures or (2) the predicted stress field based on the geomechanical stresses induced by each fracture. As such, Soliman does not anticipate each limitation of claim 1.

Claim 1 further requires, in part, “determining a geomechanical maximum number of fractures based on the geomechanical stresses induced by each of the fractures.” This limitation is not disclosed in Soliman. The Office action cites a portion of Soliman that states “[t]he number of fractures at which the maximum flow rate occurs declines with time, reaching five fractures after 1 month but declining to only two fractures after 24 months.” Soliman, at 969. Soliman’s discussion of “number of fractures at which the maximum flow rate occurs” is not a disclosure of “a geomechanical maximum number of fractures.” For example, a given formation may be able to support a large number of fractures geomechanically, but the number of fractures required for maximum flow rate may be much less. Furthermore, Soliman’s determination of “[t]he number of fractures at which the maximum flow rate occurs” is not based on “stresses induced by each of the fractures,” as required by the claim. For at least these reasons Soliman fails to disclose the limitations of claim 1.

Independent claims 18 and 24 include similar limitations, which are similarly not disclosed by Soliman. Each of the remaining claims depends from one of claims 1, 18, or 24 and are therefore patentable over the cited references.

**SUMMARY**

Applicants contend that the claims are in condition for allowance, which action is requested. Should any additional fees be required, Applicants request that the fees be debited from deposit account number 02-0383.

Respectfully submitted,

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